

All original articles published in the January through December, 1957 issues are abstracted in this index. See page 798.

SUBJECT INDEX

This is an index of all the reading matter in the ARCHIVES, except the Medical News Department.

The letters used to explain in which department the matter indexed appears are as follows: "ab," abstracts, and the asterisk (*) indicates an original article in the ARCHIVES.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Reviews" and "Deaths," are indexed under these titles at the end of the letters "B" and "D." The name of the author, in brackets, follows the subject entry. If there are more than two authors, only the name of the first author is given.

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ABSTRACTS

*The following abstracted articles have been published in the
 January-December, 1957 issues of the journal.*

JANUARY

The sixth John Stanley Coulter memorial lecture: some problems of communication in medicine as illustrated by the Coulter bibliography. F. T. Jung. Some of Dr. Coulter's earlier publications are discussed. The problem of communication between students and associates, physicians and manufacturers of diagnostic or therapeutic apparatus is presented. The necessity for abstract sections in specialty journals is emphasized and the merits of Interlingua are mentioned. (pp. 11-17)

Overwork. G. C. Knowlton, and R. L. Bennett. Overwork, as used in this paper, means a long-lasting reduction of muscle strength resulting from previous activity. Clinical and experimental experiences are cited which indicate that psychologic and even physiologic fatigue can be unreliable indicators for limitation of exercise. Ordinarily, the point of psychologic fatigue is reached before physiologic fatigue occurs and physiologic fatigue does not necessarily represent overwork; however, in certain individuals overwork levels can be reached before either psychologic or physiologic fatigue is encountered. The relation of this to therapeutic exercise and education for self-discipline is discussed. (pp. 18-20)

Comparison of effects of electric stimulation with effects of intermittent compression on the work output and endurance of denervated muscle. K. G. Wakim, and F. H. Krusen. A comparison of the effects of electric stimulation with the effects of intermittent mechanical compression applied to denervated muscle for 15 minutes every half hour throughout the 8-hour day revealed that electric stimulation improved the work output and endurance of experimentally denervated muscle, while intermittent mechanical compression did not. The beneficial effects of electric stimulation may be attributable to factors other than simple compression and decompression induced by the contraction and relaxation resulting from electric stimulation. (pp. 21-23)

Flexibility characteristics of four specialized skill groups of college athletes. J. R. Leighton. These findings are presented as strong evidence that the number and kind of specialized flexibility performance abilities vary significantly among the different specialized skills studied, and that these variations do not occur for all movements nor for the same movements among the different special skill groups. (pp. 24-28)

An evaluation of some electrodiagnostic methods: III. electromyography. R. W. Boyle, and P. A. Dudenhofer. A brief resume of the historical aspects of electromyography and early clinical research is given. The various types of apparatus used are briefly described. The physiologic basis for electromyography is discussed including nerve-muscle impulse propagation, the motor unit, the all or none theory, and the production of electrical changes with activity. The appearance of patterns from normal voluntary muscle is discussed, and comparison is made between these and the patterns formed in various neuromuscular disorders. The etiology and significance of fibrillations and fasciculations are discussed. (pp. 29-36)

Fifty years of food and drug administration protection with special relation to medical devices. I. Kerlan. The growth and changes in federal food and drug legislation since the passage of the Food and Drugs Act of 1906 are traced. The major developments of the Federal Food, Drug, and Cosmetic Act of 1938 are presented. The control of medical devices and the requirements relating to them are detailed. Legal prohibitions in the act and the ways in which the government enforces them are delineated. The physician plays an important role in relation to effective control activities in the device field. With regard to the future of the therapeutic device program suggestions are offered which will serve to promote safe and honestly labeled devices in the interest of the public health and welfare. (pp. 37-40)

Rehabilitation program in Pennsylvania: the Pennsylvania rehabilitation center. J. R. Torquato. Before Public Law 113 was enacted by Congress in 1943, rehabilitation service in Pennsylvania was inadequate. A record number of disabled were prepared for and placed in gainful employment during the calendar year 1955. Another all-time high of disabled individuals was referred to the Pennsylvania Bureau of Rehabilitation during the year and services have started for virtually all of them. Plans are under way now to double the staff in the Bureau of Rehabilitation so services can be provided to all disabled individuals within a minimum lapse of time, and a modern rehabilitation center is under construction. (pp. 41-44)

FEBRUARY

Study of cardiac output during rehabilitation activities. F. J. Kottke; J. N. Danz, and W. G. Kubicek. The cardiac demands of bed activities and light activities in occupational therapy were studied on normal subjects. The effect on cardiac output of semi-reclining at a 45 degree angle, sitting on the side of the bed, or sitting in a chair was found to vary only slightly from recumbency. Getting into and out of a bed increased cardiac output by 40 per cent. Chip carving while sitting on a straight chair increased cardiac output 15 per cent. Leather tooling while sitting in bed at a 45 degree angle increased cardiac output 24 per cent. Weaving on a floor loom while sitting on a chair increased cardiac output 77 per cent. Printing with a platen press while standing increased cardiac output 60 per cent. Body position and antigravity work are important components in determining the amount of work that the heart must do. The changes in metabolic work during activity may not correspond quantitatively with the changes of cardiac output. (pp. 75-82)

Muscle shortening produced by ultrasound. J. W. Gersten. Frog sartorius exposed to ultrasound, in vitro, shortened and developed small amounts of tension. This was not related to thermal changes or to radiation pressure effects per se. Glycerol and cocaine, a membrane stabilizer, prevented the shortening of striated muscle produced by ultrasound. It is postulated that the shortening is of the nature of a contracture, depending upon membrane changes produced by ultrasound. (pp. 83-87)

Upper extremity pylon: case report on a new device for facilitating crutch walking. J. L. Linden. A device to direct weight bearing to the healthy upper half of the forearm is described. (pp. 88-89)

Physiatry and the vocational rehabilitation program. J. Sokolow. Two important steps in the growth of physical medicine and rehabilitation are the programs developed during and after World War II and the amendments to the Vocational Rehabilitation Act in 1954. The resulting expanded program extends broad medical services to eligible persons in financial need. The new three part grant system administered by the Office of Vocational Rehabilitation is discussed and the ex-

pansion of services and extension and improvement of sheltered workshops and rehabilitation facilities are reviewed. Further, a training and teaching grant program was undertaken, which will greatly increase the number of physiatrists and stimulate awareness of the possibilities of the field on the part of other physicians. (*pp.* 90-94)

Rehabilitation's hidden dimension. W. C. Gorthy. With the development of more rehabilitation centers, need is increasing for management that will result in proper regard for the value of the professional person's time and effort, at the lowest possible cost. As services of the rehabilitation center become more comprehensive, management becomes much more complex and demands a unified and organized effort. Each profession in the center should employ the most modern technics, but the over-all management is a function that requires the application of executive skills. Key professional staff members participate in management through the development of policies that will govern the center's activities. Furthermore, when the over-all policies are adopted, with whatever limits are imposed, they have the added task of supervising their professional activities in accordance with these policies. This concept of center management has been developing at the Institute for the Crippled and Disabled and has aroused considerable interest. Specific principles and the results obtained are developed in detail. (*pp.* 95-100)

Use of the invalid lifter in the care of the severely disabled patient. E. F. Cienia; M. Hoberman, and H. L. Dervitz. The use of the invalid lifter as a valuable adjunct to the care of the severely disabled patient who must be cared for in the home without the help of professional attendants or aides is described. The criteria for a suitable lifter is explained. The use of the lifter in transferring the patient to and from wheelchair, bed, toilet, and car is described along with an analysis of the methods that can be considered basic in the use of any lifter. (*pp.* 101-108)

Clinical note: applicator for mineral oil in ultrasonic therapy. I. C. Smith. The convenience of using a plastic container which needs no stopper is described. (*p.* 108)

MARCH

Emotional aspects of chronic physical disability. E. M. Litin. Few untoward emotional reactions are witnessed in patients during the acute phases of physical disabilities. When the immediate dangers are over and the early chronic phase is entered the emotional difficulties become apparent. They become so entwined with the physical disabilities that progress or regression in one sphere is reflected in the other. Each patient has his own psychologic vulnerabilities, which become manifest in the early chronic phase when a massive evaluation and reorganization must take place. During this period previous personality patterns become all important and to a large extent determine the degree of future emotional and physical rehabilitation. Some suggestions regarding the development and management of these psychiatric complications are presented. (*pp.* 139-142)

The psychiatrist and rehabilitation. J. C. Nemiah. An important recent development in rehabilitation is the growing awareness of the importance of emotional problems in patients and the beginning of collaboration between psychiatrist and physiatrist in studying them. Two major sources of emotional conflict are the way in which injury or illness threatens the integrity of the patient's body and the security of his relationships with others. Depending on how the patient handles these problems, a variety of reaction types may be seen clinically. Case histories are cited to illustrate these types, and treatment suggestions are made. The danger of permitting psychological reactions to become chronic and the factors conspiring to make them chronic are discussed. Since the longer a psychological reaction persists the more it tends to become irreversible, the importance of preventive measures early in rehabilitation is emphasized. (*pp.* 143-147)

The effect of ultrasonic energy on osteogenic sarcoma: an experimental study. J. M. Janes; D. C. Dahlin; J. F. Herrick, and G. M. Higgins. The destructive effect of ultrasonic energy on bone has been demonstrated repeatedly in the laboratory. Medullary fibrosis associated with cortical necrosis is the most frequent finding. Bones are more susceptible to fracture following exposure to this physical agent. An experimental study of the effect of ultrasonic energy on the epiphyseal

region of young dogs and rabbits led to the conclusion that it has a destructive effect on growing bone. Defects created surgically in the femora of dogs were exposed to ultrasonic energy in order to study its effect on the healing of bone. Stimulation of the healing of these defects was not seen. Although osteogenesis was produced by this physical agent, this type of osteogenesis was purposeless and without direction as far as repair of the defects was concerned. A definite delay in healing was observed. The well-established potential destructive force of ultrasonic energy on bone obviously suggests the investigation of using this energy for possible inhibition of the growth of bone tumors as well as possible destruction of the tumors themselves. Fortunately, a method for the production of osteogenic sarcomas in rabbits was available, and these sarcomas afforded an excellent test object for the desired study. Necrosis was produced in them by ultrasonic energy. The particular technic employed for administering this agent did not ensure a field of uniform intensity and consequently islands of viable tumor cells remained. Further work is planned whereby fields of uniform ultrasonic energy may be attained, thus making possible destruction of the entire tumor. (*pp.* 148-156)

Effect of brief maximal exercise on the strength of the quadriceps femoris. D. L. Rose; S. F. Radzynski, and R. R. Beatty. This work is an attempt to confirm the studies of Hettinger and Mueller and to extend the procedure of brief maximal exercise into the clinical field. The method employed consisted of determining the maximal weight which the quadriceps femoris could carry through a full range of motion and sustain for five seconds, repeating this procedure daily with a single attempt to increase progressively the weight lifted. In 28 normals, an average increase in strength of 0.7 pound per day (to a plateau level) was observed. No significant measurable muscular hypertrophy was observed. In 32 adults with quadriceps weakness, marked variation in exercise response was observed; however, the response of some differed very little from the normal. Ten normal adults attained plateau strength by this method. The strength so attained persisted with exercise frequency as seldom as once monthly. The point at which strength is lost was not determined. (*pp.* 157-164)

New apparatus: active motion devices in physical medicine. R. Mazet, Jr., and H. J. Hogan. Several devices are described, namely, the respirator-type hand and wrist extensor, the Wadsworth extension and contraction finger exerciser, and the ski-type hip abduction-adduction exerciser. (*pp.* 165-167)

APRIL

Rehabilitation of the aphasic patient: a survey of three years' experience in a rehabilitation setting. M. Marks; M. Taylor, and H. A. Rusk. Two hundred and five aphasic patients who had been evaluated and/or treated at the Institute of Physical Medicine and Rehabilitation in the speech department comprise the basis for this study. Such factors as vocational status, education, handedness, physical disability, previous speech therapy, number of therapeutic sessions, length of therapy, time lapsed before coming to the Institute, rated degree of recovery, type of continued therapy, and cause of aphasia are data included in the statistical survey. (*pp.* 219-226)

Rehabilitation center concepts' change in practice. H. Redkey. The term rehabilitation center should be reserved for comprehensive facilities. A physical medicine department, sheltered workshop, or vocational training school is not a comprehensive center. Small out-patient treatment centers and hospitals often have difficulty planning for comprehensive centers. Adequate medical supervision and prevocational services are the most common difficulties. The breadth of meaning of the term rehabilitation is not clearly understood by many specialists involved in it. There is some inclination to divide into two main types of centers: the medical center and the vocational center. This trend could make integration of services to the patient much more difficult. Cross consultation between hospital and center and vocational agencies of various kinds will contribute enormously to good service to the rehabilitation patient. Continued change in rehabilitation center concepts is predicted. (*pp.* 227-233)

A platform crutch for the severely involved arthritic patient. M. G. Løpley, and F. J. Kottke. A platform-type crutch positioned and shaped to individual patient needs is described. (*pp.* 234-235)

A method for recording the progress of scoliosis and other trunk deformities with a review of previously suggested methods.

R. L. May. A device for measuring and recording the progress of both the lateral and rotational component of the scoliosis curve is described. (pp. 236-242)

Respiratory rehabilitation in poliomyelitis. **L. Lewis; G. G. Hirschberg, and J. P. Adamson.**

The result and rate of rehabilitation are greatly influenced by initial care in the treatment of respiratory paralysis. Prevention of hypoxia and coordinated medical and nursing care influence prognosis for survival and determine the rehabilitation potential. Accessories to the respirator help assure maximum preservation of function and diminish the frequency of complications. Careful management of the urinary tract, bowel, diet, fluid intake, and electrolyte balance are necessities of early care. Regulation of pulmonary ventilation avoids the dangers of hyperventilation alkalosis and in its sequelae. Skillful early care prepares the patient for an active rehabilitation program and eliminates long periods of mental depression with accompanying impairment of motivation. Withdrawal of respiratory aids is gauged according to rate of recovery of function. Acceptance of permanent needs for modified respiratory assistance requires careful psychological orientation of the patient. Determination of specific muscular disturbances and respiratory patterns makes it possible to specify types of abdominal and trunk supports, if needed, and provides a basis for assessing the needs for ventilation assistance in various body positions. Exercise activities must be correlated with respiratory capacity. The general rehabilitation program includes all the modalities of physical and occupational therapy together with the development of assistive devices that may range from simple feeding aids to complex electronic apparatus. (pp. 243-249)

Physical fitness index studies (PFI) in hospitalized diabetic patients. **H. T. Zankel; E. Raymer; M. Ullman, and E. Chiorian.** Diabetic patients were referred to the physical medicine and rehabilitation service for treatment. Routine physical fitness index (Rogers) studies were made of these patients at the beginning and end of treatment. Some patients were referred to the corrective therapy and manual arts therapy sections; others were

referred to the manual arts therapy section alone. The object was to determine what effect, if any, an intensive exercise program has upon the physical fitness index of hospitalized diabetics. The results, as shown by improvement in their physical fitness index, indicate that they will benefit by such a program. (pp. 250-254)

MAY

Prevocational medical evaluation of young cerebral palsied adults. **S-J. Yue, and R. C. Darling.** This paper presents a prevocational evaluation of a group of young adults suffering from cerebral palsy. The evaluation was divided into two phases. The physical phase included evaluation of the ability of the patient in ambulation, self-care, and manual dexterity. The mental phase included psychometric studies and speech and psychiatric examinations. A system is proposed to classify each patient in one of five grades in physical performance and, similarly, according to psychological assets. This scheme of classification will later be correlated with their performances in vocational evaluation. (pp. 283-289)

Prognosis for respiratory recovery in severe poliomyelitis. **J. E. Affeldt; A. G. Bower; C. W. Dail, and N. N. Arata.** In order to determine the chances of survival of a patient with acute poliomyelitis and his chances of becoming free of the respirator, an analysis of 500 such patients has been made, with a 2-year minimum follow-up. Death occurred in 15 per cent, 73 per cent became free of all respiratory equipment, and 12 per cent required some form of respiratory equipment either full or part time. The peak incidence for removal from respiratory equipment occurred during the second and third months after onset. By the first six months, 83 per cent of those to become free had done so. Vital capacity determinations are correlated with the patient's course. The average vital capacity as per cent of predicted normal at the time of becoming free of respiratory equipment was 62 per cent with a range from 23 to 100 per cent. Of the patients who continued to need a respirator, the average vital capacity was 16 per cent with a range from one to 39 per cent. Forty-one per cent of the 2-year respirator group used their equipment at night only. (pp. 290-295)

External rotation of the tibia in flaccid paralysis. G. G. Hirschberg, and L. Lewis.

The deformity of external rotation of the tibia has been described mainly in poliomyelitis, but it can be found in other forms of paralysis. It has been attributed by some to tightness of the iliotibial band. It is the purpose of this paper to show, through case studies, that gravity is the determining factor. Prevention of this deformity is always possible, but correction is difficult. The anatomical reasons for this and the roll of the cruciate ligaments are discussed. (pp. 296-299)

Capillary resistance in poliomyelitis patients with and without stress of certain physical modalities. H. N. Neu; M. S. Kramar, and W. Anthony.

Capillary resistance, as measured by the negative pressure method, is of much wider significance than it was thought hitherto. It has been determined, in normal subjects, that capillary resistance is subject to hormonal influence and is an individual trait. Physical or psychic stress may cause this individual level to change temporarily. This change, termed capillary stress response, may set in promptly and last for a few hours or may occur later and last for several days. Capillary stress response reveals typical patterns such as increase, decrease, or biphasic reaction. Capillary resistance was also investigated in poliomyelitis patients. The following questions were analyzed: Does the pathologic condition of such patients influence individual capillary resistance level? Does it modify capillary stress response? Can any effect of the intensive rehabilitation program be shown on the capillary resistance? The effect of certain physical therapy procedures on the capillary resistance was also compared in these patients. (pp. 300-306)

Understanding in rehabilitation of the severely disabled. S. M. Reichel.

Emotional stress, egocentric orientation, and depression are natural, although undesirable, parts of the symptom complex of the early phase of severe disability. The development of hypersensitivity and hyperreactivity is discussed. A limited number of attitudes of the severely disabled is mentioned as well as appropriate matching attitudes for the staff. Severely disabled patients respond best in a rehabilitation setting where they may receive treatment geared to their particular needs by a specially trained and

oriented staff, among fellow patients who are also severely disabled. (pp. 307-310)

Prevocational evaluation criteria for the severely handicapped. W. M. Usdane.

Prevocational evaluation criteria for the severely handicapped should be concerned with standards demanded for employment in competitive jobs. These jobs should be represented by work samples that test individual skill and endurance. Capacity for supervisory roles, ability to get along with fellow workers, work tolerance, attendance initiative, and other specific items can be assessed within the prevocational unit in the rehabilitation center or hospital. Norms for the work samples may be established with the help of an advisory committee that includes individuals thoroughly familiar with the nature of the job. The very nature of the limitations of the severely handicapped individual negates, however, the development of rigid criteria; there must still be an understanding of the total individual. (pp. 311-314)

Rehabilitation survey and demonstration of greater Kansas City: a research study being conducted by Community Studies, Inc., of Kansas City, Mo. E. B. Shires, and A. Wahl.

The cost and benefits of a comprehensive program for a metropolitan area are being measured by marshalling into action the community's rehabilitation potential through the coordination of medical and paramedical facilities, as well as the health, social, and vocational services, and industry and business. The methods employed by this research study in the evaluation of patients by the various professional and semiprofessional specialties are described. In addition, the organization of the team approach by the four major categories of the rehabilitation process (medical, psychological, social, vocational) will be followed throughout the rehabilitation program. (pp. 315-318)

JUNE

Significance of the pharynx in rehabilitation of poliomyelitis disabilities in the cervical area. J. F. Bosma.

The objective of motor rehabilitation in the cervical area is not mere alignment and normal relations of parts while at rest, but normal range of strength and motion requisite to swallow, control of respiration, and speech. The role of

cervical postural mechanisms in disability of the mouth, pharynx, and larynx is described. (pp. 363-368)

Changes in peripheral blood flow produced by short-wave diathermy. D. I. Abramson; A. J. Harris; P. Beaconsfield, and J. M. Schroeder. The effect of short wave diathermy on blood flow in the forearm was studied in human subjects, using the segment type of venous occlusion plethysmograph. At a bath temperature of 32 C. (under which conditions cutaneous vessels are capable of readily dilating or constricting), a significant increase in blood flow was consistently observed during diathermy and for the subsequent 40 to 60 minutes. At a bath temperature of 45 C. (under which conditions cutaneous vessels are maximally dilated), diathermy still elicited a definite increase in forearm blood flow, in many instances, of a greater magnitude than at a bath temperature of 32 C. It was concluded that diathermy augments muscle blood flow. Furthermore, when the limb is heated, the vasodilating effect of this procedure may be enhanced, a hypothesis that has clinical implications. (pp. 369-376)

Application of ultrasound to experimentally induced neuromas in dogs. D. Rubin; G. Magovern, and R. Kallenberger. Surgically induced neuromas in the sciatic nerve of two dogs were treated with ultrasound in an effort to determine whether gross and histopathological changes could be detected in such neuromas. The clinical effectiveness of ultrasound in relieving neuroma pain prompted this study. Gross comparison revealed larger proximal neuromas in the control extremity than in the treated extremity in the same animal. Study of sections of proximal and distal neuromas failed to reveal any histological differences between control and treated tissues. There was no evidence of thermal alteration in any of the soft tissues of the treated extremities. The explanation is advanced that relief of neuroma pain in patients treated with ultrasound is probably the result of an altered physiological state of the nerve tissue rather than an anatomical change in nerve structure. (pp. 377-382)

Vital capacity as an index of respiratory muscle function. C. W. Dail, and J. E. Affeldt. The deficiency of respiratory reserve,

as expressed in per cent normal vital capacity, is the integration of several factors, which may include any of the following: strength, endurance and adaptation, limitation of lung movement, distribution pattern of muscle weakness, body position, and presence of heart or lung disease, as well as certain technical factors. Before vital capacity measurements can be used to advantage as guides in treatment and in the prognosis of expected functional return, insight into all of these factors is necessary. If this is not done, vital capacity figures may be misleading. (pp. 383-391)

Problem of home treatment in arthritis. L. B. Parker, and L. F. Bender. In order to evaluate the effectiveness of instruction in home-treatment programs a survey was conducted among 56 patients with rheumatoid arthritis and osteoarthritis who had previously been instructed in adequate home-treatment programs. At the time of the interview 5 patients had stopped their home-treatment because of improvement in their condition, 27 were still continuing adequate home-treatment programs, and 24 were not treating themselves adequately. Six of these 24 patients never started on their recommended home program; 8 stopped home-treatment between two and four months after their instruction. This was greater than the number stopping in any other comparable period of time; therefore, it appears that the home-treatment program for arthritis should be reviewed with the patient at least every two months. (pp. 392-394)

Conservative management of certain types of back injury: analysis of results. D. E. Ford, and E. M. Krusen, Jr. This is a study of approximately 500 cases of acute low back strain treated in the Baylor University Hospital Physical Medicine Department during the past five and one-half years. These cases have been subjected to statistical analysis of the relationship of duration of symptoms before treatment and the relationship of compensation for injury to the result obtained, the number of treatments given and the number of days of hospitalization. (pp. 395-401)

JULY

Effect of body position on respiratory muscle function. C. W. Dail, and J. E. Affeldt. When a patient with respiratory

muscle weakness is placed in an erect position, breathing may be facilitated or impaired. Such effects are important since successful rehabilitation usually requires the patient to be erect. When there is moderate diaphragm weakness associated with abdominal muscle paralysis, breathing in a supine position may be easy, but the erect body position causes the diaphragm to descend and thus become shortened and ineffective. In diaphragm paralysis associated with strong abdominal muscles, breathing is difficult when the patient is supine but becomes easy in the erect position, permitting quite heavy activities. The diaphragm drops passively during inspiration and is elevated by abdominal contraction during expiration. It is the aim of this paper to present a practical understanding of the underlying principles since this will facilitate the therapy of such conditions. (pp. 427-434)

Further studies on the treatment of lymphedema. G. K. Stillwell; J. W. B. Redford, and F. H. Krusen. A number of patients with lymphedema of the upper extremity following radical mastectomy were treated with the vasopneumatic apparatus, the time-honored procedures of elevation of the extremity with manual massage to reduce edema, and muscle setting exercises to increase lymphatic and venous flow. Elastic supporting bandaging was used continuously during the day. When the patient learned how to do the elevation, exercises, and bandaging, these were performed at home without assistance. The progress in the reduction of the edema has been followed by volumetric measurements of the limb by displacement of water. In most instances the program has been successful in producing a significant reduction in limb size and discomfort. Among the essential features contributing to success are believed to be the supporting bandaging and the fact that the patient is taught to carry on treatment independently. (pp. 435-441)

Clinical evaluation of speech deficiencies in cerebral palsy. E. J. Lorenze, and M. A. Sokoloff. An important aspect of the physician's evaluation of the cerebral palsied child is the definitive enumeration of the speech and language deficiencies present. To assist the physician in determining what deficiencies may be present, the prognosis for improvement, and kinds of treatment involved, the authors have

reviewed 181 cases of cerebral palsied children. Included in the study are descriptions of the kinds of speech difficulties encountered, statistical breakdowns as to the incidence of each type of difficulty, and the amount of progress that may be expected with each diagnostic classification. Individual case studies are presented to illustrate technics of diagnosis and the procedures of therapy recommended for each classification. (pp. 442-449)

New apparatus: a method for the measurement of minimal muscle force. W. Bierman. A measuring device possibly minimizing some of the present day variables is described. (pp. 450-453)

Horizontal "leg press" exercises. R. H. Nyquist; C. E. Willhite; R. Jahn, and J. P. Sheridan. The results of treatment of five patients with incomplete spinal cord injury are described. Progressive resistive exercises for the lower extremities were employed by a new method that combines the resistance of springs with the traveling platform of the McCarthy exercise table. (pp. 454-455)

AUGUST

Effect of laboratory studies on treatment of atherosclerosis. J. J. Haglin; T. O. Murphy, and D. A. Felder. This report is an objective attempt to evaluate the effect of lumbar sympathectomy upon the ischemic extremity, using the electroplethysmographic measure of digital blood flow in a constant temperature environment. The effect of generalized vasodilatation by whole body heat stimulus and that of intravenous tolazoline (Priscoline) was studied. The use of whole body vasodilatation, either heat-induced or due to chemical means, is contraindicated in the sympathectomized patient, as there is a distinct reduction of digital pulse volume under these circumstances. The use of whole body heat vasodilatation to predict the effect of surgical sympathectomy is valid as to trend but is not a quantitative measure. The probable effect of lumbar sympathectomy in the older age groups and in diabetic terminal arteritis is equivocal, and may be detrimental. (pp. 491-497)

Preparation of a coaxial electromyographic needle sterilizable by heat. J. W. Gersten. A technic is described for preparation

of a coaxial electromyographic needle that may be sterilized by dry heat at the 100 to 104 C. level. (pp. 498-499)

Foot control driving apparatus for patients having little or no function in the upper extremities. O. L. Huddleston; R. W. Moore; A. G. Garriss; D. Kope, and C. Enns. A device constructed to suit the specific needs of poliomyelitis patients with severe paralysis of both upper extremities is described. (pp. 500-504)

Physical medicine and rehabilitation in the member-employee program. J. L. Rudd. The objectives of the physical medicine and rehabilitation service are not only to satisfy therapeutic needs from the very beginning, but also to inculcate a work-oriented philosophy in patients and therapists. The physical medicine and rehabilitation service personnel are in a strategic position to observe and recommend candidates for member-employee status. (pp. 505-508)

Employment outlook for physical therapists: a survey of salary and personnel policies. D. C. Augustin, and J. A. Ehmann. A tabulation of salary and personnel policies are listed in detailed table form. The survey covers the United States, Canada, Hawaii and the Commonwealth of Puerto Rico. (pp. 509-520)

SEPTEMBER

Measurements of peripheral blood flow under conditions of physiologic stress. C. J. Imig; H. Gaskill, Jr.; A. Bauer, and H. M. Hines. These studies are concerned with the effect of muscular activity on blood flow through the extremities of normal persons and patients with peripheral vascular disorders. Volume blood flow was measured by venous occlusion plethysmography before and for some time after measured amounts of exercise. The resting blood flow in patients with severe peripheral vascular disease was similar to that measured in normal subjects; however, after exercise, the blood flow through the extremities of these patients was severely deficient when compared with the normal hyperemic response. These findings suggest that the blood flow response to stress might be a better measurement than rest blood flow determinations for evaluating the status of the peripheral vascular bed. (pp. 571-573)

Gradients of functional ability of importance in rehabilitation of patients with progressive muscular and neuromuscular disease. C. A. Swinyard; G. G. Deaver, and L. Greenspan. Eight stages of functional disability are described. These gradients of progressive disability encompass criteria essential to proper ambulation pattern, method of ambulation, and efficiency in performance of activities of daily living. Graphic expression of progressive disability in muscular dystrophy and atrophy in functional terms enables visualization of the natural history of the disease and anticipation of problems of importance in rehabilitation. These data also emphasize the necessity of clearly segregating the clinical types of progressive muscular dystrophy when embarking upon an objective evaluation of the technics of rehabilitation. (pp. 574-579)

Flexibility characteristics of three specialized skill groups of champion athletes. J. R. Leighton. Evidence that significant differences exist between the means of characteristics of specialization in flexibility performance ability among skilled performers specializing in different activities is presented. This data supports previous findings that the number and kind of specialized flexibility performance abilities vary significantly among the different specialized skill groups, and that these variations do not occur for all movements nor for the same movements among the different special skill groups. (pp. 580-583)

Muscular strength-endurance relationships. H. H. Clarke. Eight muscular strength-endurance relationships are discussed. The report is confined to the study of isometric muscular endurance. (pp. 584-586)

Trends in medical education. J. E. Rhoads. Medical education is far from static. New subject matter developed by current research makes the best medical education out of date in a decade or so. Strong trends toward specialization of faculty members are somewhat in conflict with the need for teaching students an integrated body of medical knowledge. Many expedients are being tried to overcome this difficulty. (pp. 587-591)

New apparatus: a device for measuring rotation of the neck. M. W. Cheshire. A semicircular clear plastic piece with a cut-out for the neck for measuring degrees of neck rotation is described. (p. 592)

OCTOBER

Concept of motivation in physical medicine. F. C. Shontz. Motivation is not a single, unitary trait in any patient's behavior or personality. It is best described as a patterning of factors, five of which are presented as necessary, though possibly not sufficient, to account for a patient's motivational condition. When motivation is properly analyzed and defined, and when statements in each of the five areas suggested can be made with reasonable accuracy for any specific patient, the field of rehabilitation will find itself in a position to make significantly improved predictions of ultimate rehabilitation success. (*pp.* 635-639)

Contractures in chronic neurologic disease. M. Lowenthal, and J. S. Tobis. The development of contractures is an ever-present danger in lesions of the upper and lower motor neurons. A review of the literature of the past 60 to 70 years indicates a significant variation in opinion as to etiology, prophylaxis, and treatment of contractures. Special attention is given to the role of muscle proprioception in the development of contractures and also to the influence of personality factors. (*pp.* 640-645)

Rapid measurement of the tension of carbon dioxide in blood. R. W. Stow; R. F. Baer, and B. F. Randall. Compared with an analysis time of one-half to one hour, the present method is capable of giving results in ten minutes. This is a modest improvement in the speed of analysis, in some situations this saving would be of value. The accuracy of the results obtained with the pCO_2 meter rival those obtained under the best conditions with either of the chemical methods. Two of the drawbacks in applying this method which are to be considered are that the method requires specialized equipment not now in general use, and the technic is not familiar to medical laboratory personnel and would require new training and practice. (*pp.* 646-650)

Child care testing in functional training. E. F. Cienia; G. R. Stephenson, and C. F. Springer. The responsibility of child care is a crucial problem for the disabled mother after discharge from hospital or rehabilitation center. A test has been described that offers a means of evaluating the patient's skill and physical ability to carry out this task. The test provides for evaluation in two areas, management of

nursery equipment and personal care of the child. Performance can be tested with the patient in either the sitting or standing position in accordance with the patient's residual ability. A method of grading is explained which takes into account the patient's proficiency of performance, independence and safety, and time. The results of the test can be used as a basis for a teaching program in necessary child care skills based on individual needs. (*pp.* 651-655)

Clinical note: shoulder support for the hemiplegic upper extremity. W. Murray. A shoulder sling for the purpose of diverting arm weight from the shoulder capsule to the patient's suprascapular and supraclavicular region, thereby avoiding problems of neck pressure is described. (*pp.* 656-657)

NOVEMBER

Pneumatic pulsatile mobilization: a possible method of motor rehabilitation in the pharynx area. J. F. Bosma. In attempted therapeutic substitutions for the physiological variations in intraluminal pressures within the poliomyelitis-paralyzed mouth, pharynx, and larynx, an apparatus has been devised which provides periodically varied pneumatic volumes and pressures, applied to this area through an oral and oral-nasal mask. The patient contains or modulates the pulsing column of air to cause successive inflation and deflation of mouth alone, of mouth and pharynx, or of the entire respiratory tract. (*pp.* 679-681)

Physiology of skeletal muscular circulation: a review. G. K. Stillwell. The regulation of the circulation of blood to skeletal muscle is based upon three mechanisms: (1) the phenomenon of "active vasomotion," which is regulated both by local metabolites and by the sympathetic nervous system; (2) the sympathetic nervous system, which supplies the vessels to the muscles with both constrictor and dilator fibers; there are also sympathetic constrictor fibers supplying the veins; and (3) humoral control by the adrenal medullary catechols. Norepinephrine is believed to be the chemical mediator liberated by the sympathetic nerve endings. Epinephrine is believed to act primarily by stimulation of carbohydrate metabolism as a result of which the level of blood lactate is increased. The lactate may be the ultimate vasodilator. (*pp.* 682-688)

Electromyography in disc disease. F. J. Bonner, and W. H. Schmidt. A brief description of localization and measurement of nerve root compression by the electromyograph is presented. Thirty cases were selected at random from many which had electromyography and spinal surgery. In 24 of these cases the electromyograph described the exact and total localization of the pathologic condition. The advantages of electromyography in suspected surgical root involvement and the accuracy of this examination when correlated with the clinical picture have been demonstrated. (*pp.* 689-691)

Communication problems in medicine. H. Lillywhite. In the field of medicine, possibilities of misunderstanding are multiplied manifold by the nature of the vocabularies that must be used, the kind of information that must be divulged, and, in many instances, the stress under which the individuals try to communicate. Suggestions are presented as a possible aid in gaining the necessary understandings. (*pp.* 692-696)

Balanced foot-weight for quadriceps exercises. B. C. Wiley. A new balanced foot-weight that does not strain the lower leg has been developed for quadriceps exercises. The use of this balanced foot-weight has permitted more rapid increases in resistance during heavy-resistance quadriceps exercises, with resultant faster increase in strength and range of motion of knee extension. (*p.* 696)

DECEMBER

Total rehabilitation — the physiatrist's responsibility. A.B.C. Knudson. The physiatrist's formula for rehabilitation of the disabled stands out as a great monitor of medical progress, human engineering and international understanding in a world of increasing tensions. To attain the objective of the most complete and effective rehabilitation management of the patient, all must be aggressively rehabilitation minded. (*pp.* 763-770)

The seventh John Stanley Coulter memorial lecture: physical measures in the postoperative care of the surgical patient. F. B. Moor. Prolonged bed rest has certain deleterious effects, the most dangerous of which are venous thrombosis and pulmonary embolism. Early ambulation executed according to Leithouser's technic is almost a complete preventative of thrombosis and embolism, but early ambulation as currently practiced is not entirely effective. Immediate mobilization of the postsurgical patient by means of electrical stimulation of the calf muscles followed by bed exercises and then by ambulation on the first postoperative day is less strenuous for the patient than immediate ambulation and is effective in preventing thrombosis and embolism. In a controlled series of 100 major postoperative surgical cases in which sinusoidal stimulation of the calf muscles was followed by bed exercises and early ambulation, there were no instances of thrombosis or embolism. (*pp.* 771-775)

Disturbance of perception of verticality in patients with hemiplegia: second report. J. H. Bruell; M. Peszczynski, and D. Volk. Twenty hemiplegic patients were tested on a space perceptual task administered in a dark-room and which involved the perception of verticality. Nine of the patients performed like normal control subjects. The remaining eleven patients showed signs of spatial disorientation. Performance on the space perceptual task was found to be related to ambulation. In general, patients who walked well were not disoriented in the dark-room, while all wheelchair patients tested in this study were disoriented. (*pp.* 776-780)

An improved prosthesis for hemipelvectomy. S.-J. Yue, and C. R. Goldstine. Hemipelvectomy prostheses with plastic molded buckets were made for ten patients. Five patients were able to use the prosthesis fully. Two patients were able to use the prosthesis for a few hours each day; one complained of discomfort, and the other, of insecurity. Three patients were unable to use the prosthesis because of discomfort and other complications, such as neuroma and urinary incontinence. (*pp.* 781-784)

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